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1720A

Instrument Controller

Operator Manual





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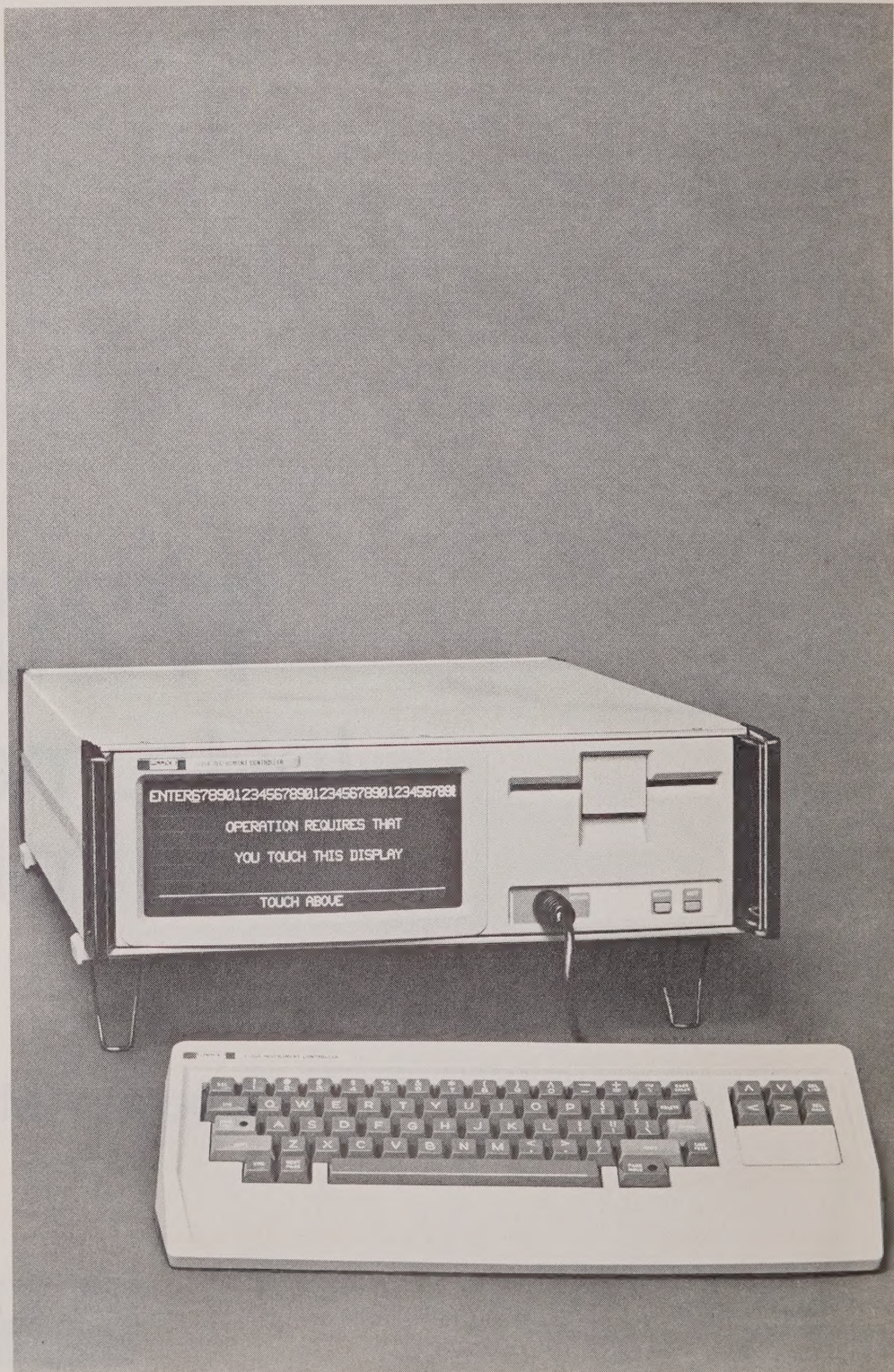
1720A

Instrument Controller

Operator Manual

P/N 518647
February 1980
Rev. 1 7/80





1720A Instrument Controller

1720A

Operator Manual

INTRODUCTION

The 1720A instrument controller is designed for you, the operator. We have designed it so you can control instruments easily and clearly without having to be a computer programmer or electronics engineer. It has a minimum of controls and adjustments, not even a keyboard. Starting a procedure is a simple matter of inserting a flexible disk and turning on the power. The controller will even tell you when it's not working correctly. The touch sensitive display allows the 1720A to be programmed so your choices while conducting a test procedure will be simple, quick, and accurate.

This book will be your guide to using the controller. It contains information on start-up procedures, safety precautions, practical information on the modules that make up the controller and information on possible system errors.

GENERAL SAFETY REQUIREMENTS

WARNING

TO AVOID ELECTRICAL SHOCK HAZARDS, THE 1720A CONTROLLER MUST BE ADEQUATELY GROUNDED, EITHER WITH THE STANDARD GROUND PLUG OR THROUGH THE SYSTEM GROUND ON THE REAR OF THE CONTROLLER. ALWAYS CONNECT THE POWER CORD TO A GROUNDED OUTLET.

OPERATING FEATURES

The controls, indicators, and connectors for the 1720A are shown in Figure 1 and described in Table 1.

OPERATING NOTES

The following paragraphs describe various operator functions that you should consider before operating the 1720A.

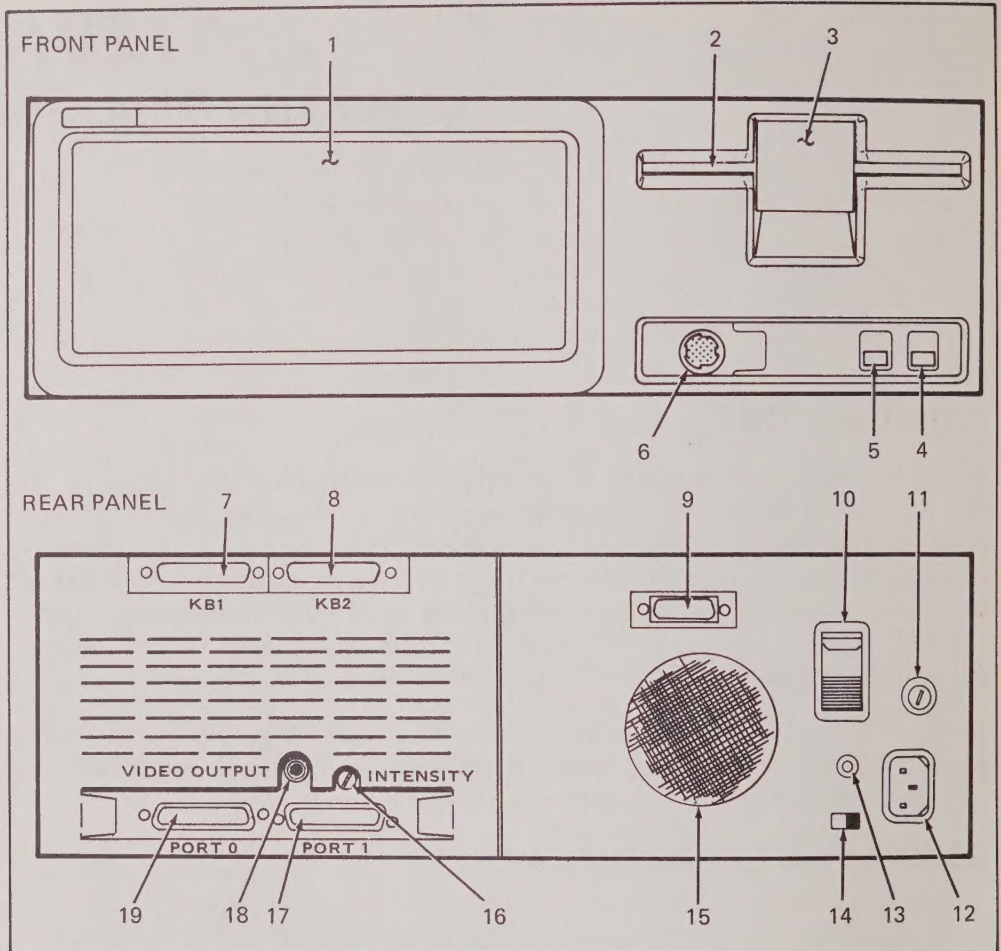


Figure 1. Front and Rear Panel Controls, Indicators and Connectors

Table 1. Front and Rear Panel Controls, Indicators and Connectors

REF. NO.	NAME	FUNCTION
1	TOUCH SENSITIVE DISPLAY	A display with touch sensitive areas which allows operation of a program by touch according to commands shown on the screen. The commands are program controlled and generated.
2	Disk Loading Slot	The floppy disk is loaded into the disk loading slot for program execution and data storage. See "Loading the Disk" for details.
3	Disk Entry Latch	Seats disk for operation.
4	ABORT pushbutton switch	Clears devices on the IEEE-488 buses and either stops the program or allows automatic program continuation, depending on your application program.
5	RESTART pushbutton switch	Initiates self test, clears all of main memory, and re-loads program.

Table 1. Front and Rear Panel Controls, Indicators and Connectors (cont)

REF. NO.	NAME	FUNCTION
6	Keyboard Connector	For connecting the detachable keyboard.
7	RS-232-C Connector #1	Standard I/O port for peripheral devices.
8	RS-232-C Connector #2	Standard I/O port for peripheral devices.
9	Remote Interface Connector	Provides for external E-Disk battery back-up, external control of ABORT and RESTART switches, and two software controlled lines.
10	Main Power Switch	Applies and removes line power to the controller.
11	Fuse	Power supply fuse.
12	Power Connector	Input line power connector.
13	System Ground	A common ground for system components.
14	E-Disk Enable Switch	Provides battery back-up for E-Disk
15	Air Filter	Filters air used to cool power supply. See maintenance procedures.
16	Display Intensity Control	A screwdriver adjust which controls the brightness of the display.
17	IEEE-488 Port 1 Connector	Standard IEEE-488-1978 Connector for instrumentation.
18	Composite Video Connector	Drives standard data display monitor.
19	IEEE-488 Port 0 Connector	Standard IEEE-488-1978 Connector for instrumentation.

Ventilation

The controller must have adequate ventilation to maintain its operating temperature. Keep it at least 4 inches, (12 cm), from a wall so that the fan may cool it properly. There is no minimum distance from top or bottom placement as the controller is designed to be mounted in a rack with other instruments.

Display Intensity

Adjust the display intensity for ease of viewing. The phosphor coating in the display will last longer at lower intensities.

Environmental Considerations

The operating range of the controller is 10°C to 40°C (50°F to 104°F), 8% to 80% humidity. Operation below 8% humidity can cause static electric discharges in the disk which may damage it and other components in the controller.

Electronic-Disk and Floppy Disk

If you turn off the controller while a test or procedure is in progress, you may lose the information being written on the floppy disk or on the Electronic-Disk, if included. Leave the system running while it is in a write operation.

E-Disk Enable Switch

The E-Disk enable switch must be in the enable mode for battery back-up of the E-Disk, should external power be interrupted.

NOTE

Battery back-up for the E-Disk will come on if the E-Disk enable switch on the controller is not in the disable mode when the system power is turned off.

System Shutdown

The controller will automatically shutdown under any one of the following conditions:

1. Internal temperature exceeds 70°C (158°F).
2. Overcurrent (controller is drawing too much current and may be overheating).
3. Overvoltage (controller regulated voltage is above limits).
4. Low Line (line voltage is below 90 volts or 180 volts).

The Flexible Disks**LOADING THE DISK**

1. Open the disk slot latch by pressing in on the top of the square panel on the disk loading slot. (See Figure 2.)
2. Insert the disk as shown in Figure 3, label side up.
3. Gently relatch the disk slot by partially closing it several times to insure seating, then close it fully.

CAUTION

If the disk-entry latch is closed when the disk is improperly seated, the disk center hole may be damaged. This can be prevented by partially lowering and raising the latch to seat the drive hub prior to total closure of the disk-entry latch.

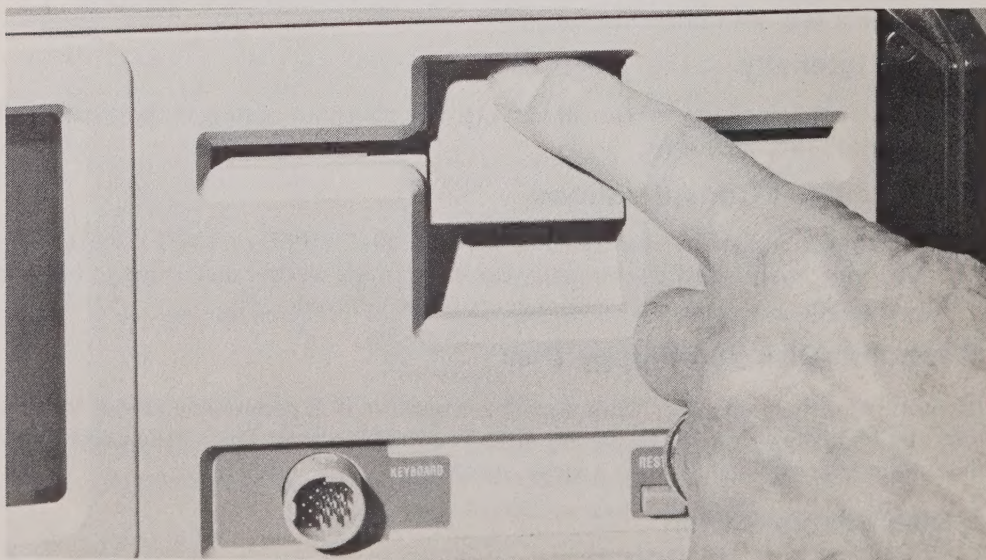


Figure 2. Opening the Disk Slot Latch

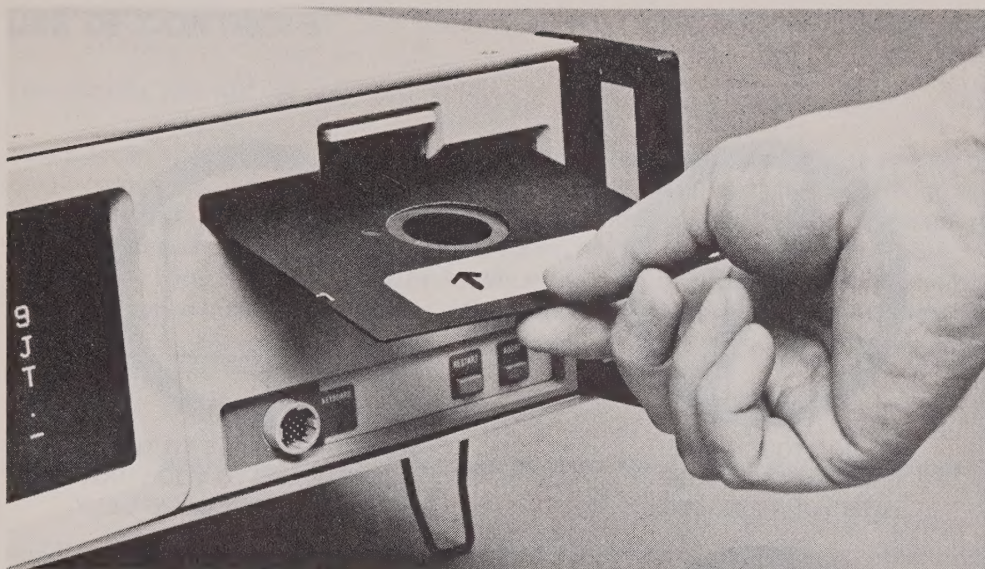


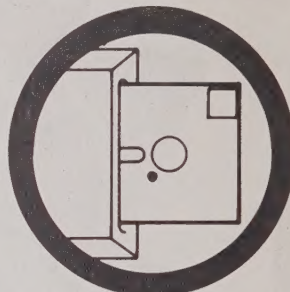
Figure 3. Inserting the Disk

CARE AND HANDLING (See Figure 4)

1. Always keep the disk in its protective folder when not in use.
2. The disk surface can be easily damaged. Do not touch the exposed disk surface with your hands or any material which may damage it.
3. Careless handling of the disks may damage them. Avoid dropping, throwing, or twisting the disks.
4. Store the disks vertically and support them so they will not bend. Stacking may distort them and affect their contents by pressing the side covers into the disk. Also avoid placing heavy objects on the disks.
5. Direct sunlight may warp the disks. Protect them from the heat of the sun.
6. Magnetic sources may erase data on the disks. Keep them away from electric motors, generators, and transformers.
7. Mark disk labels before placing them on the disk envelope or use a felt tip pen. Pressure from a ball point pen or pencil through the envelope may destroy the data on the disk.
8. Temperature affects the disk's performance. Do not use a disk that is overheated or overcooled until it has reached room temperature.



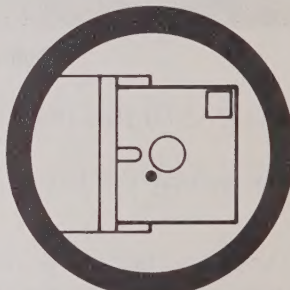
DO NOT TOUCH
PRECISION SURFACE
WITH YOUR FINGERS.



TO AVOID DAMAGE TO THE
DISKETTE AND TO YOUR DRIVE,
INSERT DISKETTE CAREFULLY.



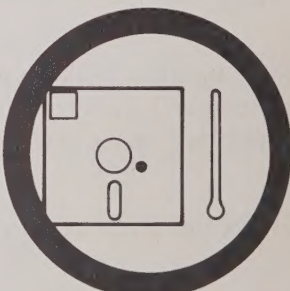
KEEP DISKETTE AWAY
FROM MAGNETIC
FIELDS.



RETURN THE DISKETTE
TO ITS JACKET WHEN
NOT IN USE.



HANDLE WITH CARE
BENDING AND
FOLDING MAY
DAMAGE DISKETTE.



DISKETTES SHOULD
BE STORED AT
10° TO 52° C.
50° TO 125° F.

Figure 4. Care and Handling of the Disk

USE OF CONTROLS

The controls you will use are:

Touch Sensitive Display: touch sensitive display panel can be programmed to operate by simple commands, individual letters, numbers, or areas which must be touched one at a time. The programmer will write system programs to display information on the screen that may require your response. Touch the screen where indicated to respond to system queries. (See Figure 5.) If you view the display at too great an angle, the resulting parallax may cause you to touch the wrong area. Make sure you are facing the screen directly when making choices. Figure 6 illustrates the importance of the viewing angle when operating the touch sensitive display keyboard.

RESTART: Initiates SELF TEST, clears all of main memory and reloads programs.

ABORT: Clears instruments on IEEE ports and depending on the program, either stops the program or reinitializes the instrument and continues.

Display brightness: (rear of panel) a screwdriver slot controls brightness of characters on the display screen. Use only as much brightness as necessary.

OPERATION

Here's how to operate your controller once the program has been written and connections made to instruments and peripheral devices. (See Figure 7.)

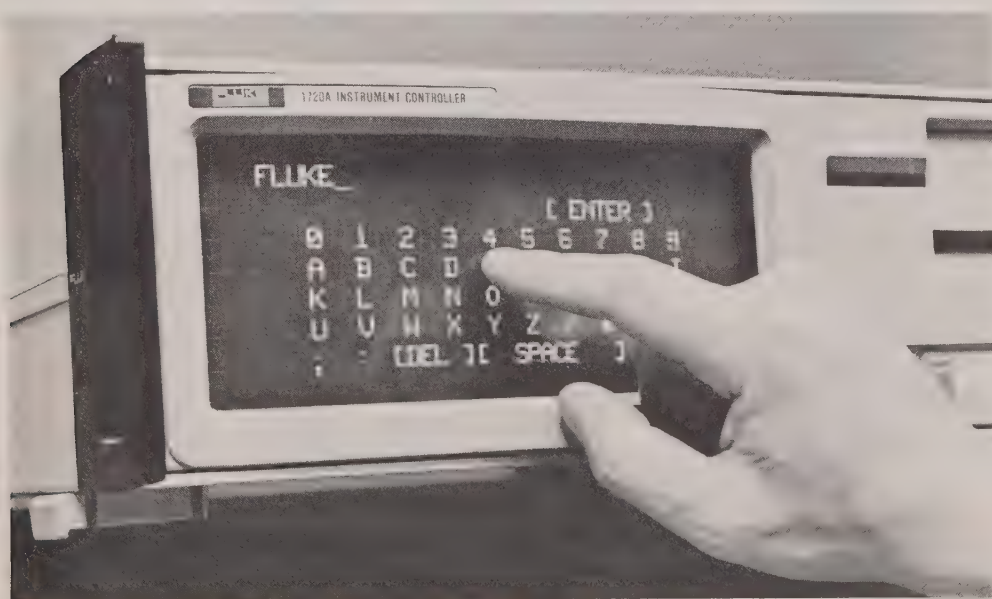


Figure 5. Touch Sensitive Display

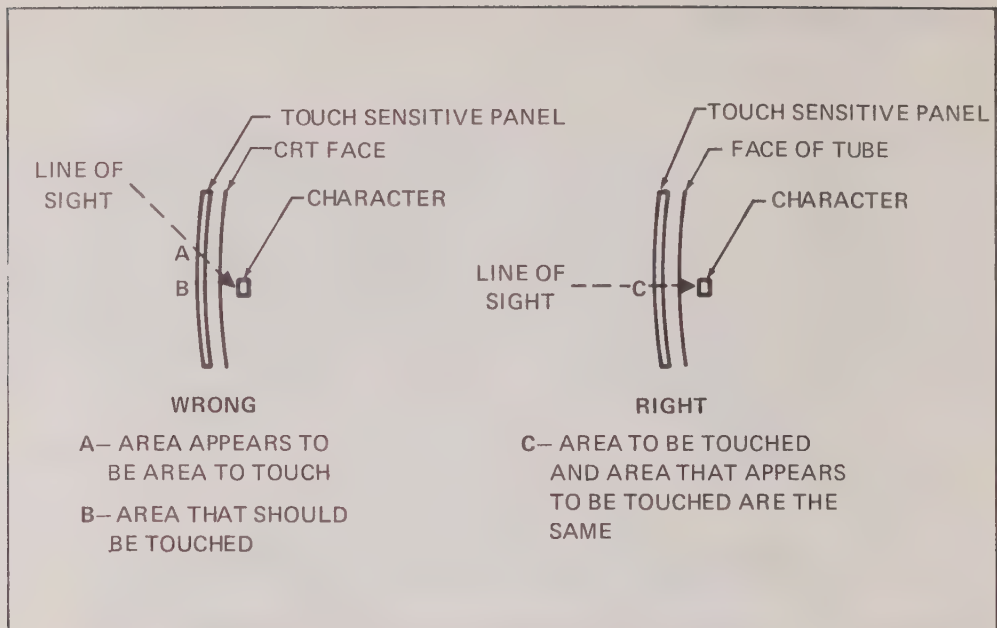


Figure 6. Parallax Distortion, Correct and Incorrect Viewing Angles

Power on Sequence (See Figure 7)

1. Insert the floppy disk. Follow the procedure outlined previously and note handling care.
2. If your 1720A is part of a system that includes a system power control, turn on system power. If system power is applied on an individual instrument basis, turn on all system instruments, including the 1720A, using the individual instrument power switches.
3. Controller runs SELF TEST once the power is turned on. (See Figure 6.) Observe any messages produced by the SELF TEST or any system test developed by your programmer. See the next section about error procedures. See your programmer for any in-house system error codes.
4. Once the SELF TEST is completed, and there are no errors, the system is ready.

NOTE

E-Disk enable switch must be in the enable mode for battery back-up.

Restart Procedure

1. Remove the floppy disk.
2. Insert a new disk as outlined in the Operating Features section and as illustrated in Figure 3.
3. Press RESTART.
4. Observe any messages which may occur.

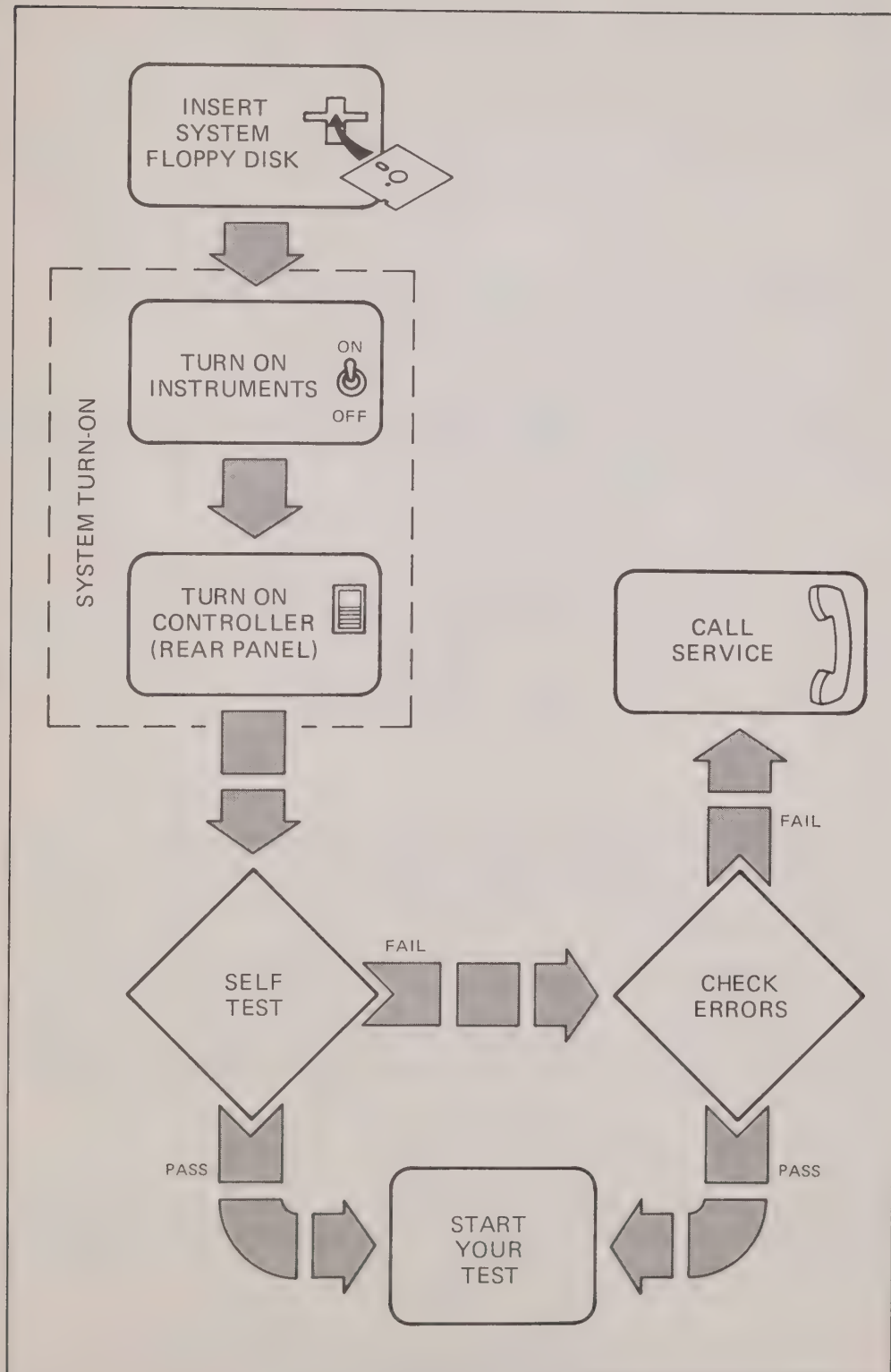


Figure 7. Power On Sequence

Power Off Sequence

1. Remove the floppy disk.
2. Turn off the system power switch or the 1720A power switch, whichever is applicable to the system you are using.

NOTE

Battery back-up for the E-Disk will come on if the E-Disk enable switch on the controller is not in the disable mode when the system power is turned off.

Error Conditions

Fluke has provided a system SELF TEST which automatically checks a number of system features at start-up. The following message is displayed on the screen while the SELF TEST is operating:

```

FLUKE 1720A CONTROLLER
      HELLO
      SELF TEST
      SELF TEST ERRORS
  
```

If all components are working properly, the programs especially written for your system will start processing. The errors in Table 2 might be displayed if any module is not operating properly. Follow the procedure for action required if you observe any of the following messages:

PROGRAM PROCESSING ERRORS

After the SELF TEST is completed, the controller will start processing the program written by your programmer. Table 2 lists some common errors which may occur during program processing.

PROGRAM ERRORS

If any of the errors listed in Table 3 occur, notify your programmer. We suggest you keep a log of them for reference by a programmer. A log space is provided at the rear of the manual.

NOTE

Only the more common program errors have been presented. If you see other error indications on the display, such as, VRBL error 901 at line 10, you must contact your programmer.

Table 2. Self Test Errors

MESSAGE	ACTION
!Memory Error	Indicates a problem with the memory board. Service may be required.
!Video Error	Indicates a problem with the video board. Service may be required.
!IEEE Missing or Faulty	Indicates a problem with the IEEE Interface board. Check whether all IEEE instruments attached to the controller are on and whether all cables are securely in place. If everything seems correct and the message still displays when you depress the RESTART switch again, service may be required. You may also wish to disconnect the IEEE cables from the controller to confirm whether the instruments are the source of trouble.
!Floppy Error	Indicates a problem with the floppy disk drive or its control board.
?No System on Device	Check that the disk in the drive is a system disk. Try another system disk. You may have inserted the wrong disk or inserted it incorrectly.
?Disk not Mounted	Insert or re-insert a system disk. Either you forgot to insert a disk or it was improperly inserted. Check whether the disk is upside down or the entry latch has not been closed.
?Floppy Error	The inserted disk is faulty. Try another system disk.
?Bad Directory on Device	The directory on the disk is incorrect. Use another disk.
ERROR	ACTION
301 Write protected disk	You probably should have a data disk inserted.
306 No more room for data on E-DISK or floppy disk	Insert another disk or check with your programmer.
400 IEEE-488 Bus timing error	Check that all devices are properly connected. If message repeats, check with your programmer.
401 IEEE-488 range error	Instrument probably turned off. Check specific instrument operation.

Table 3. Common Program Error Indications

ERROR INDICATION	MEANING
0	Too much data to fit in main memory.
1	Too large a data space was reserved by the program on E-Disk or floppy disk.
2	Too much data to fit into space reserved for it on E-Disk or floppy disk.
100	System error detected by Fluke FDOS operating software system.
101	The application program on your disk is in lexical form not compatible with this version of Fluke BASIC.*
309	Data from an RS-232-C serial port either came in too fast or was ignored by the program.
310	Input from the disk or instrument was longer than 80 characters.
800	Out of data in read: an error in your application program usually caused by failure to RESTORE a DATA statement.
801	Too many data items from disk or instrument in response to an INPUT statement in your program.
802	Not enough data items from disk or instrument in response to an INPUT statement in your program.
*Programmer's Note: obtain an ASCII (.BAS) backup file to your lexical program, enter and save it lexically under the new version of Fluke BASIC.	

MAINTENANCE

You can safely perform maintenance procedures. These are limited to fuse replacement and cleaning. All other maintenance requirements should be referred to qualified personnel.

Fuse Replacement

Either a 3A Slo-Blo fuse for 120V service or MDL 1½A Slo-Blo fuse for 240V service is used to protect the power line from an accidental overload. Use the following procedure to replace a fuse:

1. Turn off the instrument power.
2. Remove the power cord from the back panel.
3. Locate the fuse holder on the rear panel.
4. Replace the fuse by pressing in the fuse cap and turning it 1/8 turn counterclockwise. Use a suitable screwdriver.
5. Install the new fuse in the fuse cap and install both in the fuse holder.
6. Turn on the power.

Touch Sensitive Display

Clean the display with a soft cloth and any commercially available glass cleaner. Avoid abrasive cleaners and paper towels on the mylar surface as they may scratch it.

Air Filter

A dirty air filter may cause the system to overheat and shutdown. Use the following procedure to clean the air filter:

1. Locate the air filter on the rear panel.
2. Remove the air filter by pinching it in the center with two fingers and pulling it from the housing.
3. Clean the air filter in water and mild detergent or a mild solvent.
4. Dry the air filter thoroughly and replace it.

CAUTION

Replacing a filter which is still wet may damage internal components.

Disk Drive

The disk drive requires no operator maintenance.

CAUTION

Lubrication of the disk drive mechanism is unnecessary. Never apply oil to the disk drive mechanism. Never insert an object into the disk drive opening other than a disk, you may damage the mechanism if you do. If there is trouble with the drive, contact a Fluke Service Center.

Table 4. Fluke Technical Service Centers, U.S. and Canada

UNITED STATES		
CA, Burbank Fluke Technical Center 2020 N. Lincoln Street Burbank, CA 91504 (213) 849-4641	MA, Waltham Fluke Technical Center 244 Second Avenue Waltham, MA 02154 (617) 890-1604	TX, Dallas Fluke Technical Center 14400 Midway Road Dallas, TX 75240 (214) 233-9945
CA, Santa Clara Fluke Technical Center 2300 Walsh Avenue Santa Clara, CA 95050 (408) 985-1200	MD, Rockville Fluke Technical Center 5640 Fishers Lane Rockville, MD 20852 (301) 770-1576	WA, Mountlake Terrace John Fluke Mfg. Co., Inc. 21707 66th Avenue W., Suite 1 Mountlake Terrace, WA 98043 (206) 774-2206
CO, Denver Fluke Technical Center 1980 S. Quebec Street, Unit 4 Denver, CO 80231 (303) 750-1228	MN, Apple Valley Fluke Technical Center 7373 West 147th Street, Suite 196 Apple Valley, MN 55124 (612) 432-9400	CANADA
FL, Orlando Fluke Technical Center 940 N. Fern Creek Avenue Orlando, FL 32803 (305) 896-2296	NC, Greensboro Fluke Technical Center 1310 Beaman Place Greensboro, NC 27408 (919) 273-1918	ALB, Calgary Allan Crawford Assoc., Ltd. 1935 30th Avenue N.E. #14 Calgary, ALB T2E 6Z5 (403) 230-1341
IL, Rolling Meadows Fluke Technical Center 1400 Hicks Road Rolling Meadows, IL 60008 (312) 398-5800	NJ, Paramus Fluke Technical Center West 75th Century Road Paramus, NJ 07652 (210) 262-9550	ONT, Mississauga Allan Crawford Assoc., Ltd. 6503 Northam Drive Mississauga, ONT L4V 1J5 (416) 678-1500
		QUE, St. Laurent Allan Crawford Assoc., Ltd. 7018 Cote de Liesse St. Laurent, QUE H4T 1E7 (514) 731-8564

Table 5. Sales and Service Locations, International

ARGENTINA Fluke Latin American Service Headquarters Virrey del Pino 4071 Buenos Aires, Argentina Tel: 523185	CHILE Intronica Chile Ltda. Casilla 16228 Santiago 9, Chile Tel: 44940	FINLAND Oy Findip AB Teollisuustie 7 02700 Kauniainen Finland Tel: 09-358-0-502255
AUSTRALIA Elmeasco Instrument Pty Ltd. P.O. Box 30 Concord, N.S.W. Australia 2137 Tel: (02) 736-2888	COLOMBIA Coasin Ltda. Carrera 13, # 37-37, Of. 407 Ap. Aero 29583 Bogota DE, Colombia Tel: 285-0230	FRANCE M.B. Electronique S.A. Rue Fourny ZAC de BUC B.P. #31 78530 BUC, France Tel: 09-33-1-9568131
AUSTRIA Walter Rekersch Elektronische Gerate GmbH & Co. Vertriebs-KG. Liechtensteinstrasse 97/6 A-1090 Vienna, Austria Tel: 09-43-222-347646	DENMARK Tage Olsen A/S Ballerup Byvej 222 DK-2750 Ballerup Denmark Tel: (01) 2-65 81 11	GREECE Hellenic Scientific Representations Ltd. 11, Vrassida Street Athens 615, Greece Tel: 09-30-1-711140
BELGIUM Fluke (Belgium) S.A./N.V. 6, Rue de Geneve 1140 Brussels, Belgium Tel: 09-32-2-2164090	ECUADOR Proteco Coasin Cia., Ltda. Edificio "Jerico" Ave. 12 de Octubre #2285y Ave. Orellana (Planta Baja) Quito, Ecuador Tel: 526759	HONG KONG Gilman Industrial Bldg., 9F 107-109 Wai Yip Street Kwun Tong Kowloon, Hong Kong Tel: 3-427144
BRAZIL Arotec S.A. Industria e Comercio Av. Pacaembu 811 01234 Sao Paulo S.P., Brazil Tel: 826-2266	EGYPT Lotus Engineering Organisation P.O. Box 1252 Cairo, Egypt Tel: 71617	

Table 5. Fluke Technical Service Centers - International (cont)

INDIA

Hinditron Services Pvt. Ltd.
"Hinditron House"
412 Raj Mahal Vilas Extension
Bangalore 560 006, India
Tel: 33139

Hinditron Services Pvt. Ltd.
69 A.L. Jagmohandas Marg
Bombay 400 006, India
Tel: 365344

INDONESIA

P.T. Dwi Tunggal Jaya Sakti
Sangga Buana Bldg., 1st Floor
J1. Senen Raya 44, P.O. Box 4435
Jakarta, Indonesia
Tel: 376608

IRAN

Irantronics Company Ltd.
20 Salm Road
Roosevelt Avenue
Tehran, Iran
Tel: 828294/831564

ISRAEL

R.D.T. Electronics Engineering Ltd.
P.O. Box 75
46, Sokolov Street
Ramat Hasharon 47235
Israel
Tel: 09-972-3-483211

ITALY

Sistrel S.p.A.
Via Timavo 66
20099 Sesto S. Giovanni (Milan)
Italy
Tel: 09-39-2-2476693

Sistrel S.P.A.
Via Guiseppe Armellini #37
00143 Rome, Italy
Tel: 09-39-6-5915551

JAPAN

John Fluke Mfg. Co., Inc.
Japan Branch
1 Higashikata-machi
Midori-ku
Yokohama 226, Japan
Tel: (045) 473-5425

KOREA

Electro-Science Korea Co.
C.P.O. Box 8446
Room 1201 Bowon Bldg.
490 Chongro - 5 Ka
Chongro-ku
Seoul, Korea
Tel: 261-7702

MALASIA

O'Connor's (Malaysia) SDN. BHD
P.O. Box 91
Petaling Jaya, Selangor
West Malaysia
Tel: 51563

MEXICO

C.J. Christensen S.A. De C.V.
Melchor Ocampo 150-8
Mexico 4 D.F., Mexico
Tel: (905) 535-2258

NETHERLANDS

Fluke (Nederland) B.V.
P.O. Box 5053
5004 EB Tilburg
The Netherlands
Tel: (013) 673973

NEW ZEALAND

W & K McLean Ltd.
P.O. Box 18065
Glen Innes
Auckland, New Zealand
Tel: 587-037

NORWAY

Morgenstjerne & Co. A/A
Konghellegate 3
P.O. Box 6688, Rodelokka
Oslo 5, Norway
Tel: 09-47-2-356110

PAKISTAN

Pak International Operations
505 Mohammadi House
1.1. Chundrigar Road
Katrachi-2 Pakistan
Tel: 221127/239052

PERU

Importaciones Y Representaciones
Electronicas S.A.
Avda. Franklin D. Roosevelt 105
Lima 1, Peru
Tel: 288650

PORTUGAL

Equipamentos de Laboratorio, Ltda
P.O. Box 1100
Lisbon 1002, Portugal
Tel: 09-351-1-578936/547512

REPUBLIC OF SINGAPORE

Rank O'Connor's (PTE) Ltd
98 Pasir Panjang Road
Singapore 0511
Republic of Singapore
Tel: 637944

REPUBLIC OF SOUTH AFRICA

Fluke S.A. (Pty) Ltd
P.O. Box 39797
Bramley 2018
Republic of South Africa
Tel: (011) 786-3170

SPAIN

Hispano Electronica S.A
Apartado de Correos 48
Alcorcon (Madrid)
Spain
Tel: 09-3416194108

SWEDEN

Teleinstrument AB
P.O. Box 490
S-162 Vallingby 4
Sweden
Tel: 09-46-8-380370

SWITZERLAND

Traco Electronic AG
Jenatschstrasse 1
8002 Zurich
Switzerland
Tel: 09-41-1-2010711

TAIWAN

CCT Associates, Inc.
P.O. Box 24209
Taipei, Taiwan
Republic of China
Tel: (02) 391-6894/393-5760

THAILAND

Dynamic Supply Engineering R.O.P.
56 Ekamai, Sukhumvit 63
Bangkok-11, Thailand
Tel: 914434/928532

TURKEY

Erkman Elektronik Aletler
Ticaret Anonim Sirketi
Necatibey Cad 92/3
Karakoy, Istanbul, Turkey
Tel: 09-44-1-5461

UNITED KINGDOM

Fluke International Corp. - UK
Colonial Way
Watford, Herts. WD24TT
United Kingdom
Tel: 09-4492340511

URUGUAY

Coasin Uruguay S.R.L.
Edificio Ciudadela
Sarandi 690 D. Esc. 109
Casilla de Correos 1400
Correo Central
Montevideo, Uruguay
Tel: 917978

VENEZUELA

Coasin C.A.
Apdo. Postal 50939
Sabana Grande # 1
Caracas 105, Venezuela
Tel: 782-9109

WEST GERMANY

Fluke (Deutschland) GmbH
Krausstrasse 32
8045 Ismaning
West Germany
Tel: (089) 96251

Customers in the following countries: Bulgaria, Czechoslovakia, Hungary, Poland, Romania, U.S.S.R., and Yugoslavia, contact: Amtest Associates Ltd., P.O. Box 55, Addlestone, Surrey, KT 15 1DU, England, Tel. (0932) 52121



PROGRAM NAME	ERROR PRODUCING SITUATION	ERROR INDICATION

PROGRAM NAME	ERROR PRODUCING SITUATION	ERROR INDICATION

PROGRAM NAME	ERROR PRODUCING SITUATION	ERROR INDICATION

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1029155